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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/828,663	04/21/2004	Peter R. Hull	135830	4932

7590 12/06/2006
John S. Beulick
Armstrong Teasdale LLP
Suite 2600
One Metropolitan Square
St. Louis, MO 63102

EXAMINER

KIM, TAE JUN

ART UNIT	PAPER NUMBER
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3746

DATE MAILED: 12/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/828,663	Applicant(s) HULL ET AL.	
	Examiner Ted Kim	Art Unit 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-21 is/are pending in the application.
 4a) Of the above claim(s) 11-14, 19 and 20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-10, 15-18 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06/28/2006 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 8-10, 15-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Dyste et al (3,222,864). Dyste et al teach gas turbine engine comprising: a compressor; a combustor downstream from said compressor; a turbine coupled in flow communication with said combustor; a heat exchanger assembly for a gas turbine engine, said heat exchanger assembly comprising: an annular manifold comprising an inlet manifold (near 52) coupled in flow communication with a compressor and an outlet manifold (near element number 70) coupled in flow communication with a combustor 80, said annular manifold substantially concentrically aligned with respect to an axis of rotation of the gas

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turbine engine, and said inlet manifold and said outlet manifold each including an outermost surface -- 50 for the inlet, portion of 46 downstream of 52, 54 for the outlet -- having a *substantially* equal radial distance with respect to the axis of rotation of the gas turbine engine; and an annular heat exchanger 14 coupled in flow communication to the compressor via said annular manifold, said heat exchanger configured to channel compressor discharge air to said combustor, said heat exchanger assembly coupled to said gas turbine engine such that said heat exchanger 14 is substantially concentrically aligned with respect to the axis of rotation of the gas turbine engine, said heat exchanger comprising a plurality of heat exchanger elements (note that the aggregate of the pipes 60 are aligned substantially perpendicular to a direction of exhaust flow discharged from the gas turbine engine); said heat exchanger coupled in flow communication to said compressor via said annular manifold, said plurality of heat exchanger elements 60 aligned in an approximate sinusoidal arrangement extending around an inner periphery of an outer casing (e.g. the outermost 60 in Fig. 2 is shown to be in an alternating fashion such that a sinusoidal curve can be drawn through them; an outer casing can be read on the portion of the casing 46 upstream of circa elements 52, 54); each said heat exchanger element comprising an inlet side in flow communication with said inlet manifold and an outlet side in flow communication with said outlet manifold; wherein said inlet manifold comprises a cross-sectional area that is inversely proportional to a cross-sectional area of said outlet manifold (note that the cross sectional area of the inlet and manifolds are in the same annular region of the engine and that as one of them gets bigger by inverse

proportion is inherently smaller); a plug nozzle 94 fixedly secured to a gas turbine rear frame to facilitate controlling an amount of compressor air channeled through said heat exchanger.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 8-10, 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zirin (3,201,938) in view of either Beam, Jr et al (3,386,243) or Dyste et al (3,222,864).

Zirin teaches a gas turbine engine comprising: a compressor 11; a combustor 12 downstream from said compressor; a turbine 13, 14 coupled in flow communication with said combustor; an annular manifold comprising an inlet manifold 24 coupled in flow communication with a compressor and an outlet manifold 23 coupled in flow communication with a combustor, said annular manifold substantially concentrically aligned with respect to an axis of rotation of the gas turbine engine, and said inlet manifold and said outlet manifold each including an outermost surface having a *substantially* equal radial distance with respect to the axis of rotation of the gas turbine engine; and an annular heat exchanger 32 coupled in flow communication to the compressor via said annular manifold and a heat exchanger assembly 22 comprising: a

heat exchanger 22 that appears to be annular (note that among other things manifolds 23, 24 are annular) coupled in flow communication to a compressor 11, said heat exchanger 22 configured to channel compressor discharge air 28 to a combustor, said heat exchanger assembly 22 coupled to said gas turbine engine such that said heat exchanger 22 is substantially concentrically aligned with respect to an axis of rotation of the gas turbine engine; said heat exchanger comprising a plurality of heat exchanger elements aligned substantially perpendicular (the portion where element number in fig. 2 is located is in a location where the exhaust gas flows substantially perpendicular to the pipes— alternately note that the heat exchange elements 47 are substantially perpendicular to the exhaust gas) to a direction of exhaust flow discharged from the gas turbine engine. A heat exchanger assembly 22 for a gas turbine engine, said heat exchanger assembly comprising: a heat exchanger 22 that appears to be annular coupled in flow communication to a compressor, said heat exchanger configured to channel compressor discharge air 28 to a combustor, said heat exchanger assembly coupled to said gas turbine engine such that said heat exchanger is substantially concentrically aligned with respect to an axis of rotation of the gas turbine engine; said plurality of heat exchanger elements aligned in an approximate sinusoidal arrangement extending around an inner periphery of an outer casing; an outer casing 20 coupled to said heat exchanger and to a gas turbine rear frame such that said heat exchanger is substantially concentrically aligned with respect to an axis of rotation of the gas turbine engine; and wherein said heat exchanger comprises a plurality of heat exchanger elements, each said heat exchanger element

comprising an inlet side in flow communication with said inlet manifold 24 and an outlet side in flow communication with said outlet manifold 23; wherein said inlet manifold comprises a cross-sectional area that is inversely proportional to a cross-sectional area of said outlet manifold (note that the cross sectional area of the inlet and manifolds are in the same annular region of the engine and that as one of them gets bigger by inverse proportion is inherently smaller); a plug nozzle (see Fig. 5) fixedly secured to a gas turbine rear frame to facilitate controlling an amount of compressor air channeled through said heat exchanger. As discussed above, it would appear that the heat exchanger is annular, but in order to obviate any doubt, Beam Jr et al and Dyste et al teach that the heat exchanger is annular. It would have been obvious to make the heat exchanger annular as a well known or conventional configuration utilized in the art.

6. Claims 8-10, 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dyste et al (3,222,864) in view of Colby (2,969,642). Dyste et al teach various aspects of the claimed invention and in the interpretation above have different portions of the casing 46 read on the outermost surface of the outlet manifold of the annular manifold and the outer casing. Alternately, Colby teaches it is old and well known in the art to use an additional outer casing 20 surrounding an outlet manifold near element 66 of an annular heat exchanger for the gas turbine engine. It would have been obvious to one of ordinary skill in the art to employ an additional outer casing, in order to provide for greater structural integrity and/or strength for the manifold assembly.

7. Claims 8-10, 15-18, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over any of the above applied art, and further in view of either Cook (2,925,714) or Moskowitz et al (3,735,588). The above applied art teach various aspects of the claimed invention but do not teach the use of fins substantially parallel to the direction of the exhaust flow discharged from the gas turbine engine. Cook teaches using fins 61 substantially parallel to the flow. Moskowitz et al teach using fins (Fig. 5) substantially parallel to the direction of the exhaust flow discharged from the gas turbine engine. It would have been obvious to one of ordinary skill in the art to employ fins, as taught by either Cook or Moskowitz et al, in order to increase the heat exchange efficiency. In an alternate interpretation by combining the fins with the heat exchange elements of the above applied prior art, the fins can be read on the plurality of heat exchange elements aligned substantially perpendicular to a direction of exhaust flow discharge from the gas turbine engine.

Response to Arguments

8. Applicant's arguments filed 06/28/2006 have been fully considered but they are not persuasive.

9. Applicant's arguments concerning Dyste et al are not persuasive. Dyste clearly shows that the wall 38 curves near the downstream end and is at the same radial distance as 50. Furthermore, applicant's use of the phrase "substantially equal" allows some variation of the radial distance and Dyste et al clearly meet the limitation of "substantially equal."

10. Applicant's arguments concerning Zirin are also based on the same language of "substantially equal" allows some variation of the radial distance and Zirin clearly meets the limitation of being "*substantially* equal."

11. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

12. All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the

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advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Contact Information

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax number for the organization where this application is assigned is 571-273-8300.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ehud Gartenberg, can be reached at 571-272-4828. Alternate inquiries to Technology Center 3700 can be made via 571-272-3700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at <http://www.uspto.gov/main/patents.htm>

	
Ted Kim	Telephone 571-272-4829
Primary Examiner	Fax (Regular) 571-273-8300
November 30, 2006	Fax (After Final) 571-273-8300
Technology Center 3700	Telephone 571-272-3700